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Signatures of Electron-Phonon Coupling in Oxygen K-Edge RIXS on quasi-1D edge-shared cuprates.

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Continued advancements in RIXS instrumentation have significantly increased the resolution of these experiments. As a result, features within 60-100 meV of the elastic line are becoming resolvable and recent experiments at the oxygen-K edge of the quasi-1D edge-shared cuprate Ca_{2+x}Y_{2-x}Cu_5O_{10} have uncovered detailed peak structure near the elastic line. In this poster we interpret these features as being due to coupling to a particular oxygen phonon mode and present large-scale exact diagonalization calculation for multi-band Hubbard clusters with the inclusion of lattice degrees of freedom. This model reproduces both the peak structure near the elastic line as well as its observed doping dependence. Furthermore, the coupling strength inferred from this study indicates a sizable strength of el-ph coupling with implications for other cuprate systems.

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Resonant inelastic and Elastic X-ray scattering

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poster

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